Multilayer Gratings with High Efficiency in the Extreme Ultraviolet

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Abstract No. seel1209
Beamline(s): **X24C**

MoRu/Be multilayer coatings were applied to two diffraction gratings for the purpose of enhancing their normal-incidence efficiency in the 11.1-12.0 nm wavelength range. The grating substrates were replicas of a holographic master grating that had a blazed groove profile with 2400 grooves/mm and a 2 m radius of curvature. The relatively low average microroughness (0.8 nm) of the grating surfaces contributed to the relatively high groove efficiency of the grating substrates and the reflectance of the MoRu/Be multilayer coatings. The peak efficiency, measured using synchrotron radiation, was 10.4% in the second diffraction order at a wavelength of 11.37 nm.